

## Abstract of the Disclosure

A method for antenna subset selection by joint processing in RF and baseband in a multi-antenna systems.  $L_t$  input data streams are generated in a transmitter for either diversity transmission or multiplexing transmission. These streams are modulated to RF signals. These signals are switched to the  $t$  branches associated with the  $t$  transmit antennas, and a phase-shift transformation is applied to the RF signals by a  $t \times t$  matrix multiplication operator  $\Phi_1$ , whose output are  $t \geq L_t$  RF signals. These signals are transmitted over a channel by  $t$  antennas. The transmitted signals are received by  $r$  antennas in a receiver. A phase-shift transformation is applied to the  $r$  RF signals by a  $r \times r$  matrix multiplication operator  $\Phi_2$ .  $L_r$  branches of these phase shifted streams are demodulated and further processed in baseband to recover the input data streams.